HLA C2 Experiment
Status Report

Presented to:

DMSO Architecture Management Group

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Outline

- Experiment Background / Overview
- Candidate Objectives
- System Architecture
- Process/Execution Strategy
- Status / Issues

Experiment Background

- DMSO, JSIMS & Services interested in simulations interoperating with real-world C4I.
- DMSO desires a collaborative effort of HLA technology exploration and MRCI development
- DMSO funded JTFp now in JSIMS testbed.
- DMSO funding MRCI development.
- DMSO funding this experiment as an effort to evaluate the MRCI in the context of HLA compliant modeling and simulation.

Experiment Participants

AGENCY	ROLE	POC
DMSO	Activity Lead	Maj Steve Zeswitz
JSIMS	Testbed, Admin.	Dave Pratt, Bill Hudgins
ESC	Air Warfare	Tim Rudolph, Tony Luches
TRAC	Land Warfare	Kent Picket, Jack Ogren
SPAWAR	Naval Warfare	Les Parish, Bill Stevens
NRaD	MRCI / C2	Tom Tiernan, Cindy Keune
AEgis	System Integ.	Bill Waite, Mike Lightner

Experiment Approach Overview

- Start with the existing JSIMS testbed (JTFp).
- Extend with addition of three real-world C4I systems interfaced via the MRCI.
- Modify simulation Federates to interact with real-world C4I components
- Integrate in modified Federation Controller
- Define objectives, requirements, scenarios, FOM and test/analysis plans.
- Implement those plans.

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Candidate Objectives

- **GENERAL CAPABILITY**
  - » Conduct a proof-of principle demonstration of HLA simulations interoperating with Real-World C4I via MRCI and evaluate the utility of such federations in support of Training, Analysis and COAD&E.
- **HLA OPERATIONS**
  - » Extend the experience-base for the HLA process model by exploring the impact/affect on HLA operations of the integration of real-world C4I aspects/components, via the MRCI, with simulations in HLA federations.

Candidate Objectives

- **SIMULATION REPRESENTATION, SYNCHRONIZATION & RECONCILIATION REQUIREMENTS**
  - » Look at representation, synchronization and reconciliation issues involved with having real-world C4I and simulations interacting in an HLA federation.
- **TOOLS EVALUATION & REQUIREMENTS**
  - » Evaluate utility of existing/identify possible new automated tools for HLA federations using real-world C2 systems with MRCI interfaces.

Candidate Objectives

- **FEDERATE EVALUATIONS**
  - » In light of adding real-world C4I via the MRCI to an HLA federation of simulations, investigate and pursue areas of specific interest/concern to the participating federates in the experiment.
- **C2 DIF EVALUATION**
  - » Evaluate the C2 data interchange format (DIF) (e.g. CCSIL)

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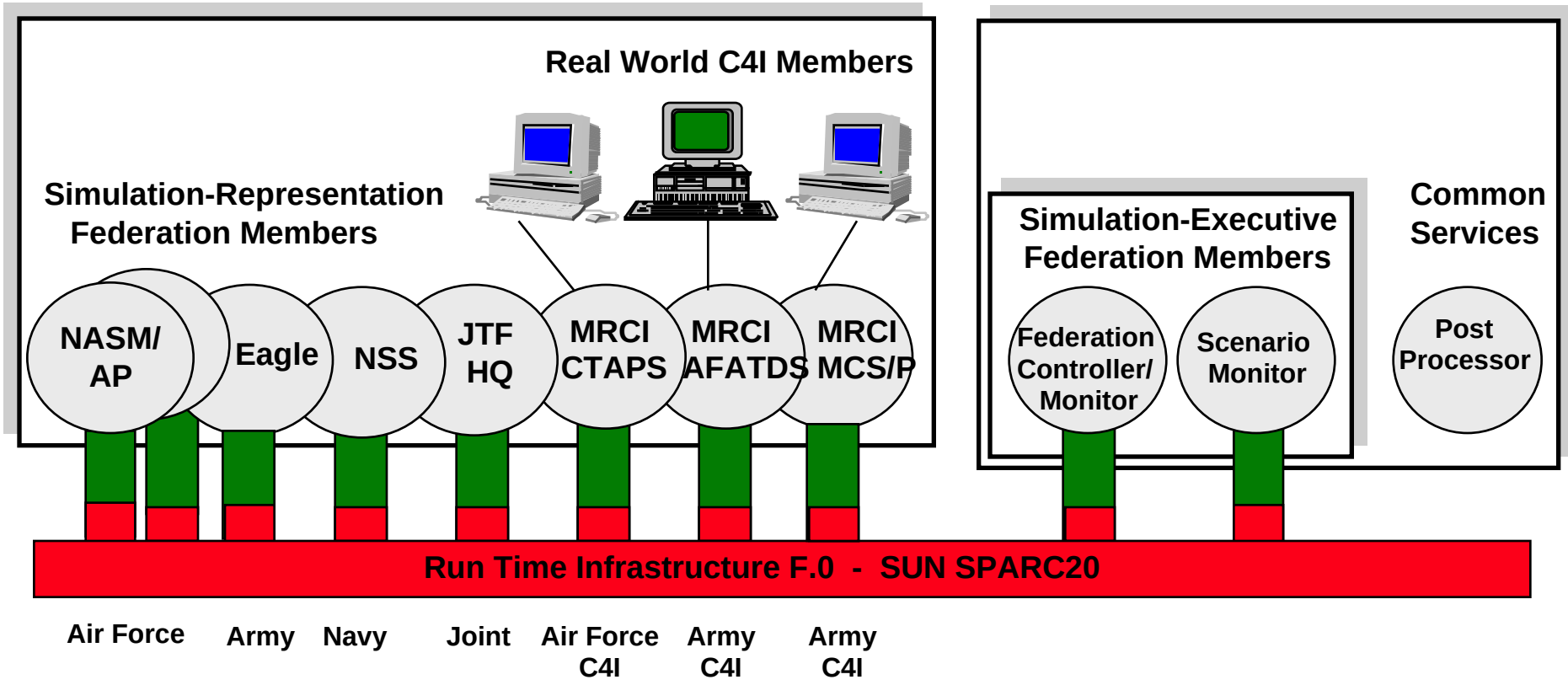
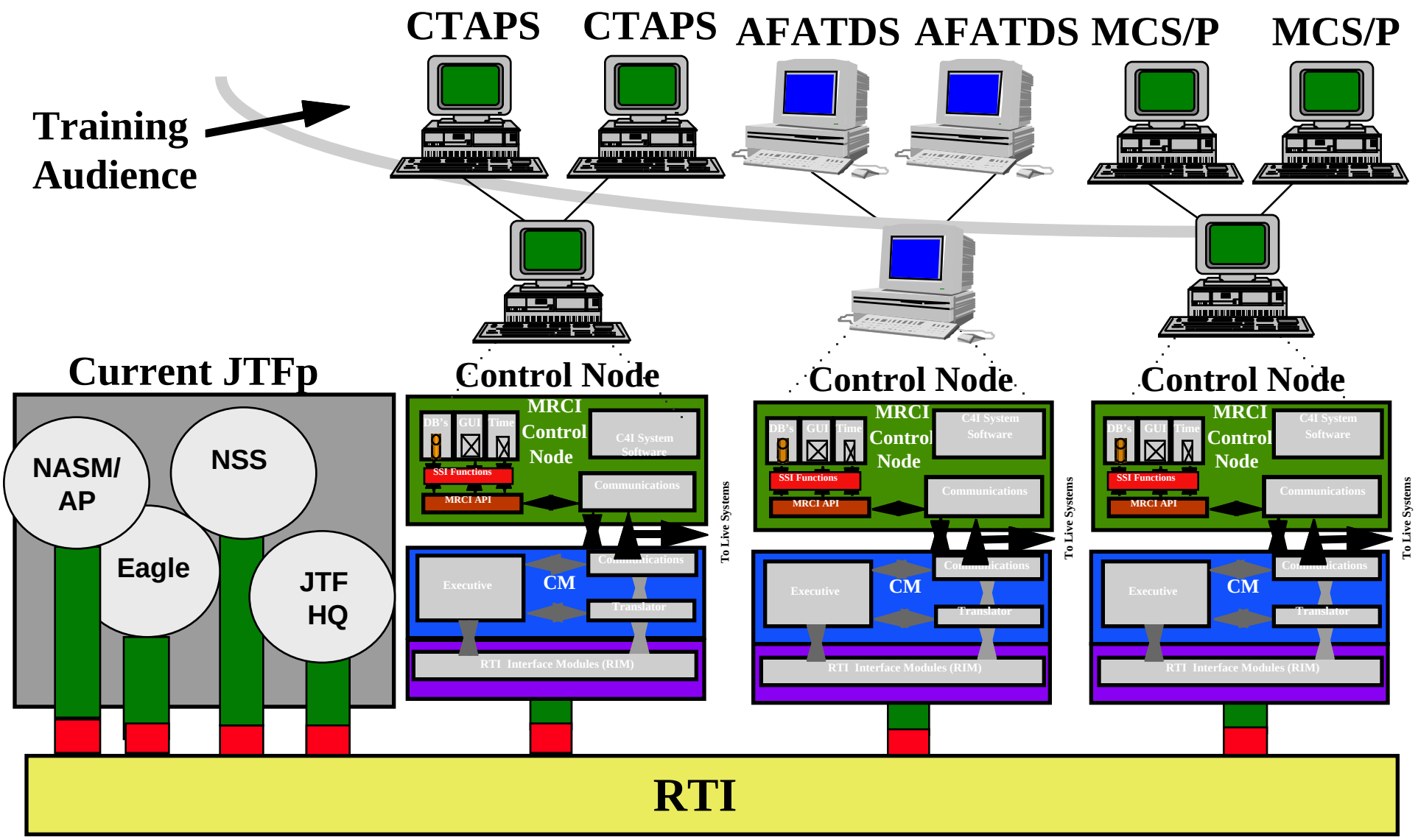
HLA C2 Federation System



Anticipating Homogeneous Network Of SUN SPARC20s

Addition of Real World C2 using MRCI



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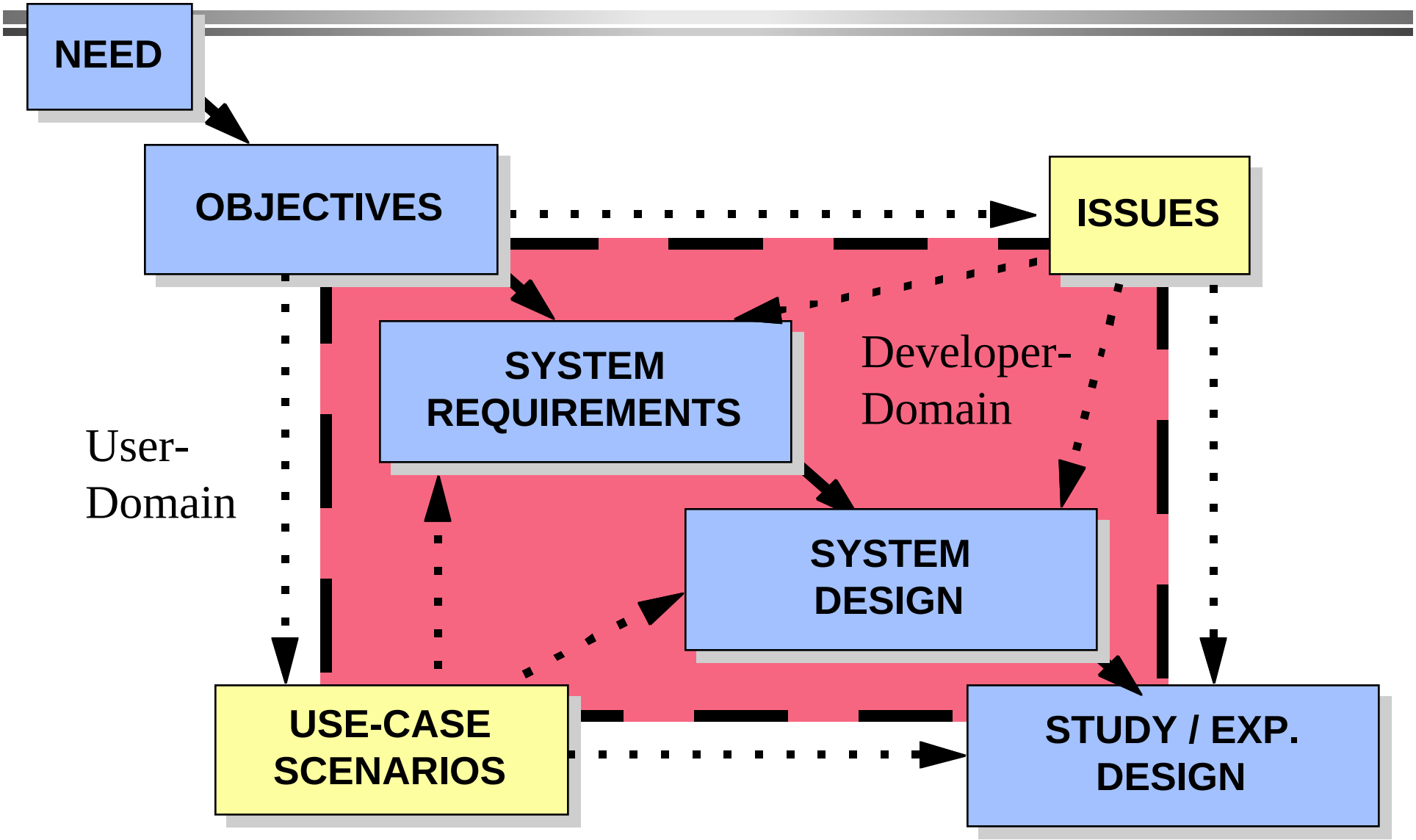
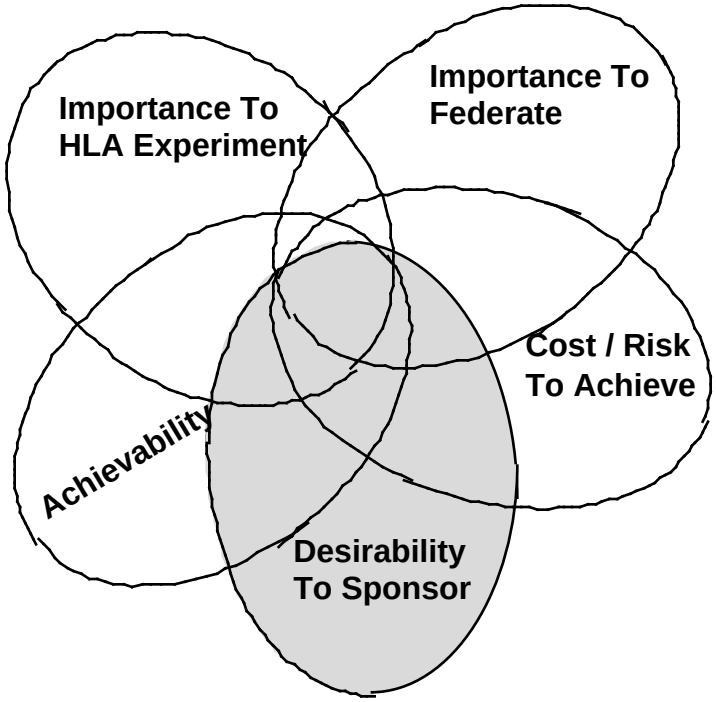
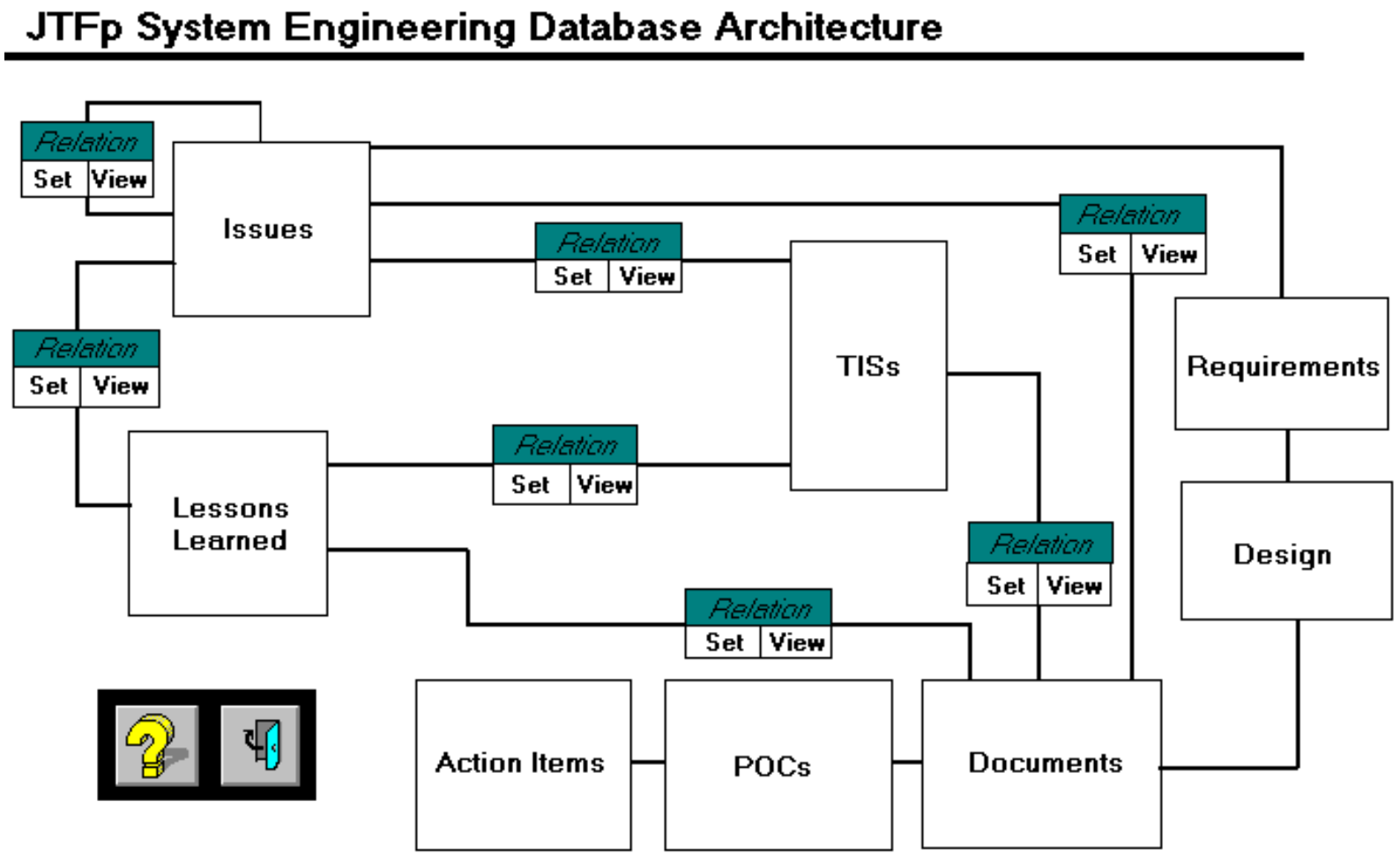
HLA C2 Enterprise Requirements-Flow Influence Diagram



Objectives / Issues Qualification Criteria



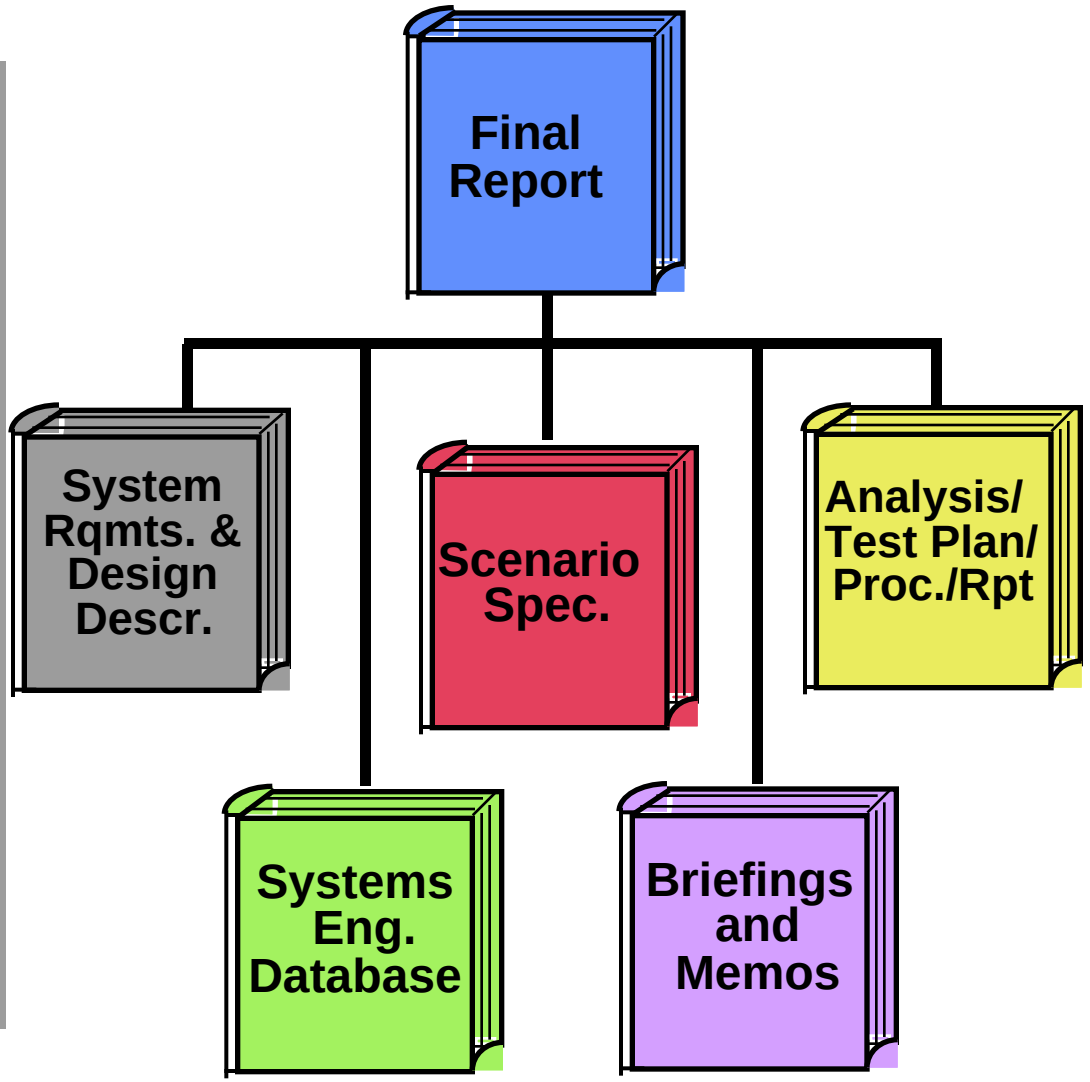
Systems Engineering Database



Experiment Products

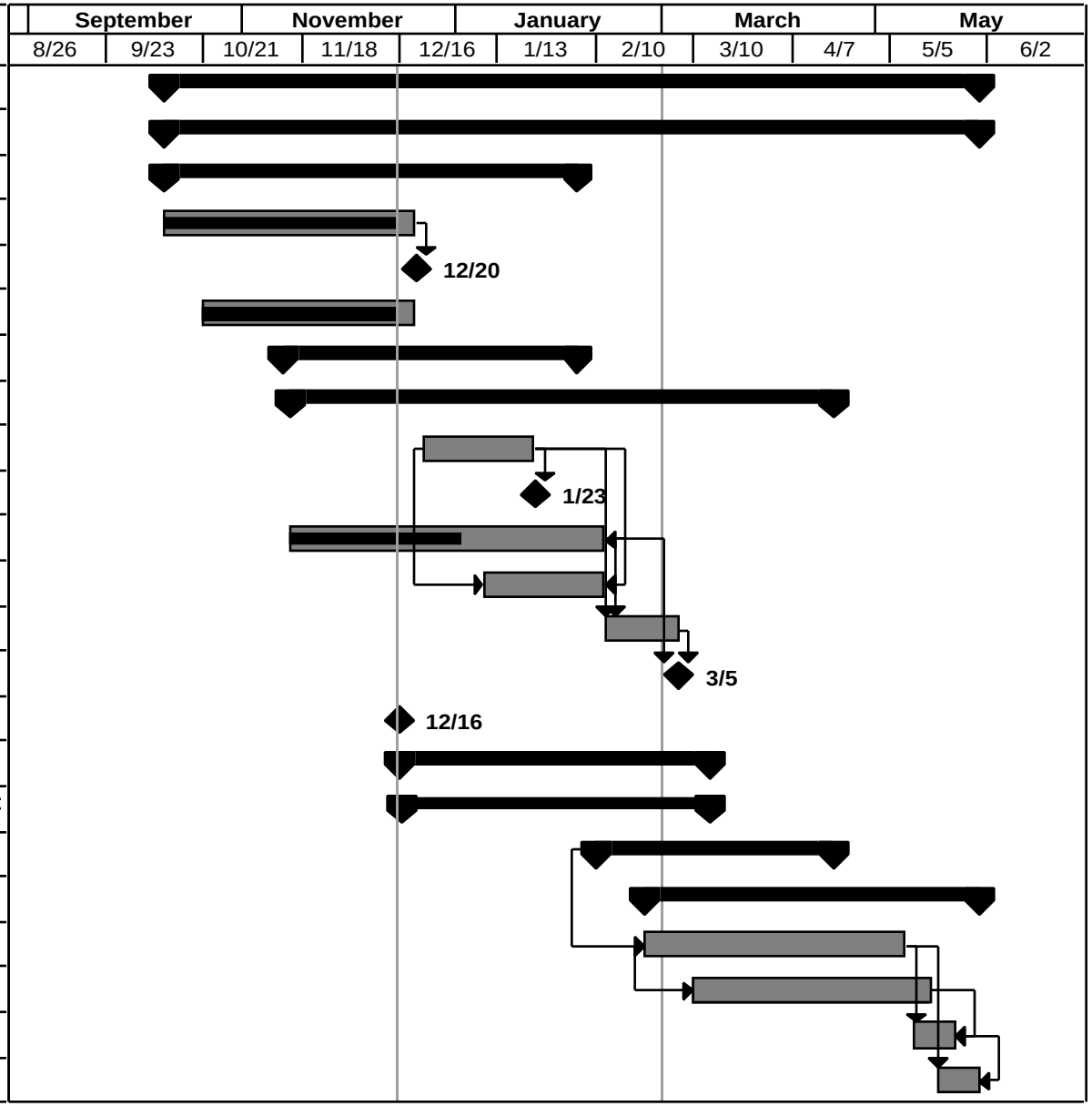
Experiment Activities

- Objectives/Requirements Definition
- Scenario Definition
- FOM Development
- System Design
- Component Modifications
- System Integration
- Analysis & Test Plans Development
- Test Plan Execution
- Data Collection & Analysis
- Reporting of Results



Draft Program Plan

ID	Task Name
1	**PROGRAM MILESTONES**
11	**PROGRAM MANAGEMENT**
186	**PROGRAM PLANNING**
187	Program Objectives Identification
188	Draft Statement of Objectives
189	Program Plan Development
190	**STUDY / EXPERIMENT DESIGN**
199	**SYSTEM DEVELOPMENT**
200	System Requirements Identification
201	Draft System Requirements Document
202	System Component Identification
203	FOM Derivation
204	System Design Specification
205	Darft System Architecture Specification
206	RTI Availability
207	**C2 Component Development / Modification**
214	**JSIMS Component Development / Modificat**
221	**System Integration**
230	**EXPERIMENTAL TEST and EVALUATION**
231	Trials Execution
232	Data Collection and Analysis
233	Net Assessment
234	Final Report Derivation



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Status

- Initial Meeting: 10 Oct 96
  - » Organized the HLA C2 IPT.
  - » Defined roles & responsibilities.
  - » Addressed administrative operations.
  - » Discussed strategies for experiment.
- Technical Coordination Meeting: 29 Oct 96
  - » Further defined concepts & objectives.
  - » Discussed approach for FOM development.
  - » Defined communication/record keeping activities.

Status (Cont.)

- Conference Call: 19 Nov 96
  - » Completed Action Item review.
  - » Agreed On approach for identifying objectives.
- Technical Coordination Meeting: 3 Dec 96
  - » Agreed on conceptual approach to experiment enterprise / requirements flow.
  - » Conducted detailed discussion of experiment objectives and program plan.
  - » Established subgroup to define scenarios.

Issues

- Platforms Supported by RTI
  - » Hardware acquisition
  - » Porting of components
- Schedule Influences
  - » Completion of funding activities
  - » Alignment with schedules of related projects

BACKUP

SLIDES

Candidate Objectives

- **GENERAL CAPABILITY**
  - » **Conduct proof-of principle demonstration of HLA simulations interoperating with Real-World C4I equipment via the MRCI**
  - » **Evaluate the likely utility of the HLA and MRCI in support of Training, Analysis and COAD&E**
- **HLA OPERATIONS**
  - » **Illustrate the flexibility/efficiency of preparation & execution of HLA federations which include Real-World C4I equipment interfaced via the MRCI**
  - » **Extend the experience-base for the HLA process-model by exploring the integration of Real-World C4I aspects/components**
  - » **Provide feedback on HLA components implementation (e.g.. RTI F.0, MRCI, Federation Controller)**

Candidate Objectives

- **SIMULATION REPRESENTATION, SYNCHRONIZATION AND RECONCILIATION REQUIREMENTS**
  - » **Identify extent to which adding Real-World C4I aspects to an HLA Federation levies requirements on simulations in that federation**
  - » **Demonstrate the exercise of the entire warfighting C2 life cycle and capture lessons-learned in that process**
- **TOOLS EVALUATION AND REQUIREMENTS**
  - » **Evaluate utility of existing/identify possible new automated tools for HLA federations using Real-World C2 systems w/ MRCI interfaces**
- **C2 DIF EVALUATION**
  - » **Evaluate the C2 data interchange format (DIF) (e.g.. CCSIL)**

Candidate Objectives

- **MRCI Federates**
  - » **Assess the basic premise of MRCI**
  - » **Evaluate the extensibility and portability of the MRCI Software**
  - » **Assess MRCI functionality: message translation, effects applications, initial database synchronization**
  - » **Evaluate the MRCI technical performance: including the effects on C4I systems and simulations**
  - » **Assess what is required to make a C2 system an HLA federate.**
- **NASM/AP**
  - » **Demonstrate ability to read, interpret and issue appropriate C2 messages to/from MRCI for all real-world life cycle activities (planning, execution, BDA, pre-planning)**
  - » **Assess extent to which NASM/AP insures realism of the effects of incoming real-world C2 messages on the simulation and vise versa.**

Candidate Objectives

- **NSS**
  - » **Demonstrate mechanism of linking NSS with real-world C2 systems using the HLA and MRCI**
  - » **Investigate the feasibility of the HLA and MRCI to support the areas of training, analysis and COAD&E**
- **EAGLE**
  - » **Demonstrate ability to read, interpret and issue the core set of CCSIL messages**
  - » **Demonstrate ability to achieve seamless replacement of real-world C2 with simulated C2 and vice versa (i.e. the cognitive/ command decision process aspect of C2)**
- **JTF HQ**
  - » **Demonstrate the utility of using the JTFHQ class object as place to implement simulation space C2 actions**

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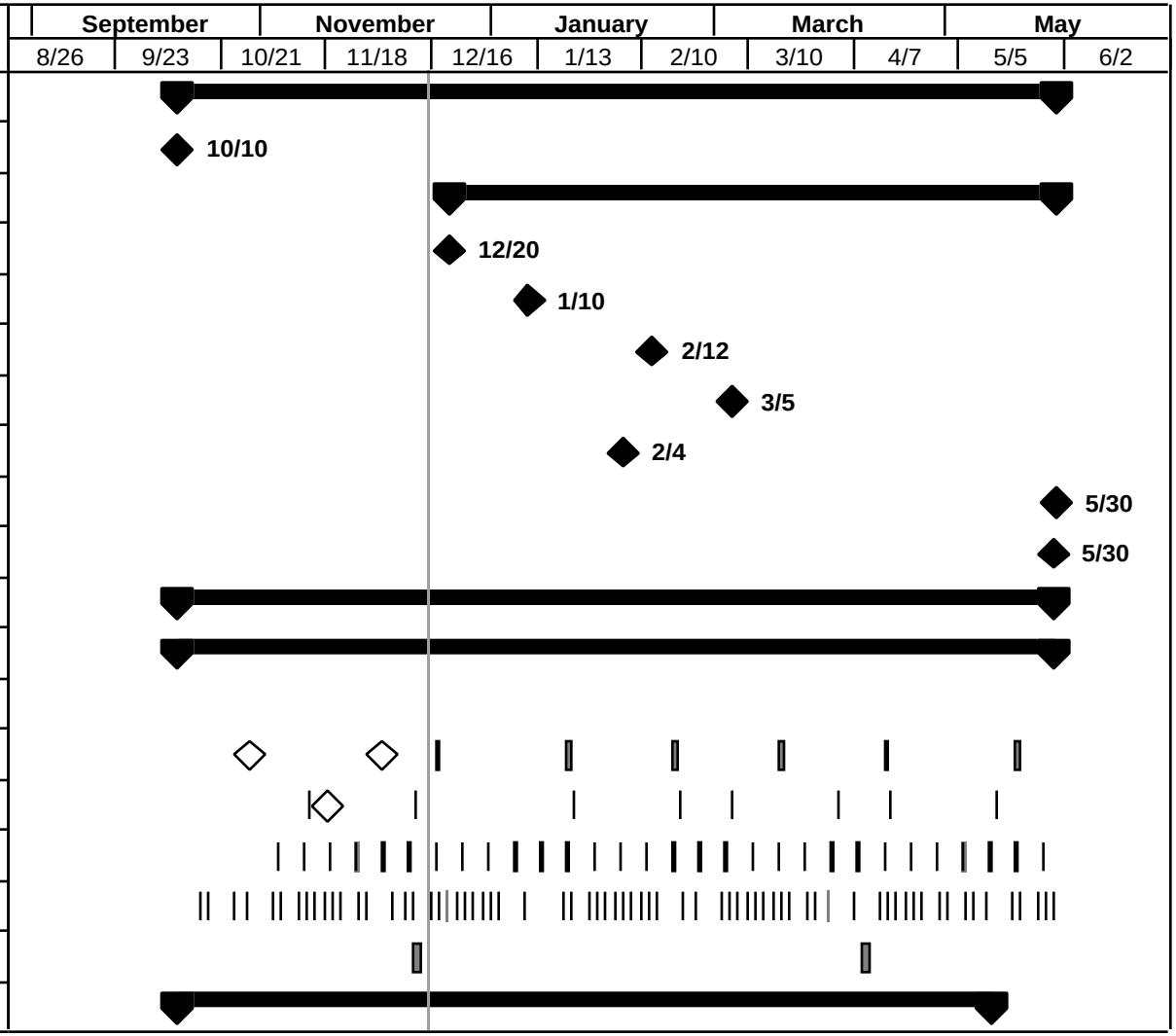
ID	Task Name
1	**PROGRAM MILESTONES**
2	**Program Initiation**
3	**Product Delivery**
4	Program Plan \ Schedule
5	Experiment/Study Plan
6	Federation Object Model (FOM)
7	System Design Specification
8	Analysis Plan
9	Final Program Report
10	**Program Completion**
11	**PROGRAM MANAGEMENT**
12	**Coordination with Participating Agencies**
13	Program Kickoff Meeting
14	**Technical Interchange Meetings**
23	**Conference Calls**
39	**1-1 Coordination**
70	**Electronic Media Maintenance**
169	**AMG Support**
172	**Ad Hoc Coordination**



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191	Issues Identification
192	Draft Statement of Issues
193	Study / Experiment Plan Development
194	Scenario Specification
195	Experiment Scenarios Specification
196	Experimental Trials Identification
197	Test Plan
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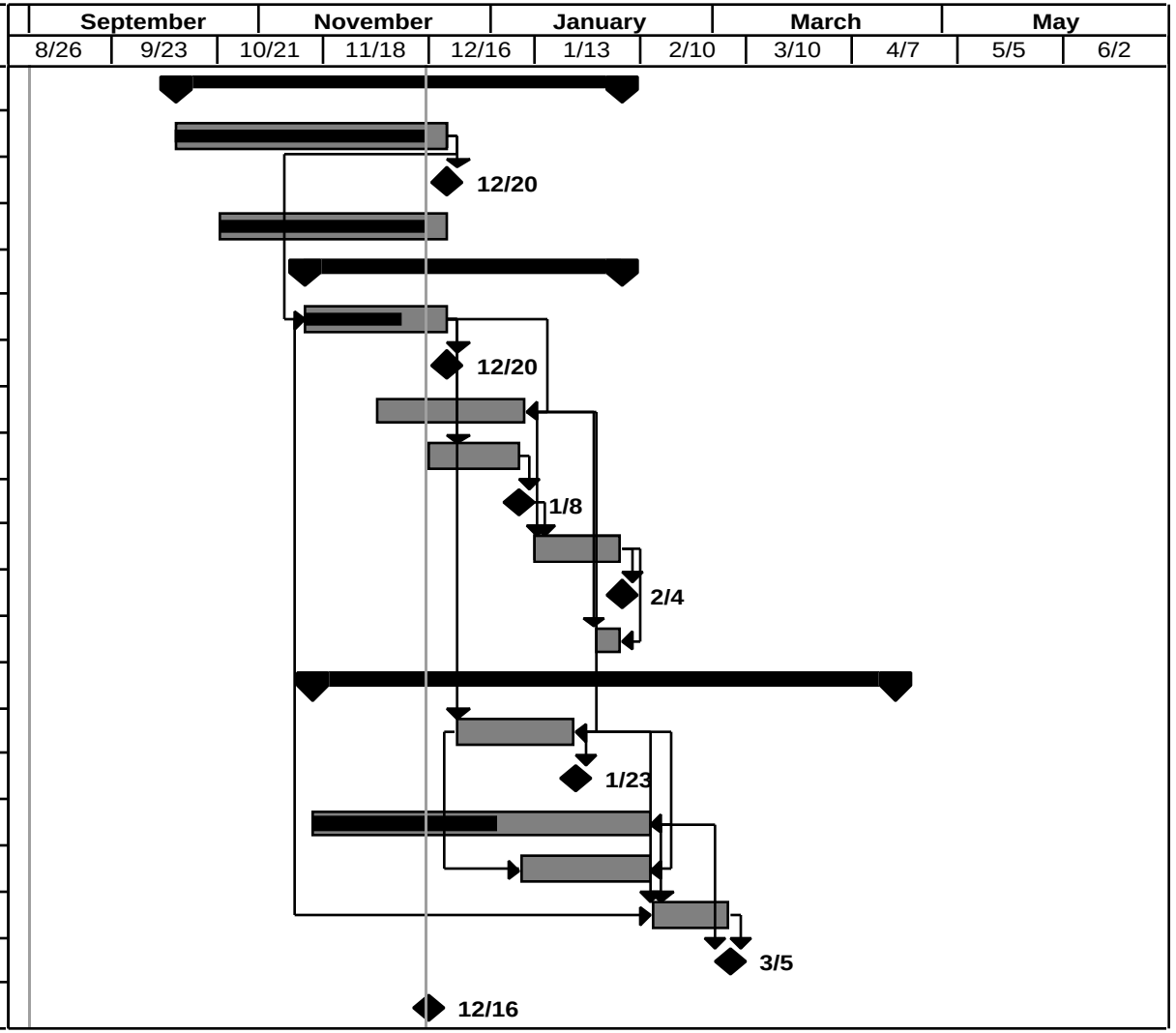

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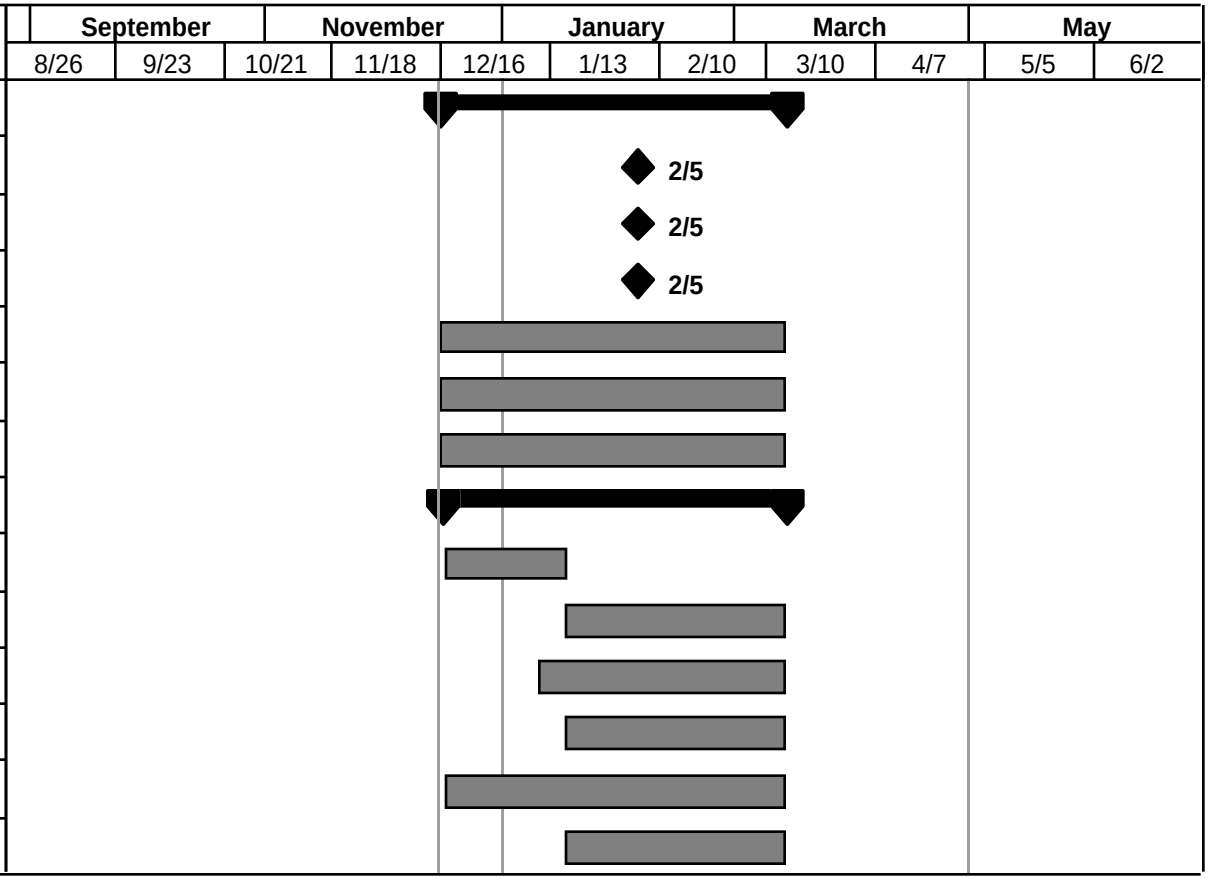
207	**C2 Component Development / Modification**
208	MRCI Availability
209	MRCI Documentation
210	H/W Delivery to Testbed for MRCI Elemer
211	CTAPS
212	AFATDS
213	MCS/P
214	**JSIMS Component Development / Modificat**
215	Upgrade JSIMS Testbed to RTI F.0
216	Federation Controller
217	JTF HQ
218	NSS
219	EAGLE
220	NASM/AP



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222	Federation Controller
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224	NSS
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